SPARK

REPORT

STRATEGIC
PLANNING
FOR
APPLIED
RESEARCH
AND
KNOWLEDGE

Science
Council of
British
Columbia

"FINANCING A KNOWLEDGE-BASED FUTURE"

prepared by
THE SPARK FISCAL COMMITTEE

FINAL REPORT

FEBRUARY, 1992

This report has been prepared by the SPARK Fiscal Committee and represents the views of the members of that Committee. While SPARK is an initiative of the Science Council of British Columbia, the views and recommendations expressed in the report are not necessarily those of SPARK, the members of the Steering Committee or the Science Council.

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this report was drafted with the assistance of Aldyen Donnelly, SPARK Fiscal Committee Champion

SPARK Fiscal Committee
Final Report

February, 1992

FOREWORD TO THE FINAL REPORT

We are pleased to present the final Report of the SPARK Fiscal Committee.

The Report Development Process

This report includes many people's views. The Committee worked over a year to assemble its Draft Report which was presented for public input in December, 1990. One public forum was held that raised comment from many sectors including the academic, financial, corporate and government communities. Separate meetings were held with other interested groups. Throughout this final report, comments are made on significant changes to our original draft that have resulted directly from stakeholder and public feedback.

The Committee has been encouraged by the responses of many persons in government, both at the political and public service levels, as well as many members of the scientific and business communities. Several proposals have been initiated as a result of SPARK Fiscal Committee draft recommendations and it is hoped that the opportunity will arise to extend what has taken place to date, to cover all points of what, in the Committee's view, should be the agenda for growth of knowledge-based economic activity in British Columbia.

The FISCAL Committee Mission

SPARK Fiscal Committee's original mandate was to consider an apparent shortage in the supply of equity for early stage knowledge-based businesses. The Committee's first task was to translate this mandate into a mission, with goals and objectives. The following mission was developed:

> "to propose to the government of British Columbia methods to encourage the formation of permanent, world-class knowledge-based companies."

In the early stages of our research and discussions, we were forced to struggle with a dilemma:

- many unfunded ventures believe there is a lack of risk capital, but,
- many suppliers of risk capital believe there is an insufficient supply of good business concepts and management teams which might merit venture investment.

The Committee found that the question of equity supply is complex, and that three problem areas need to be addressed coincidentally:

- the supply of superior research talent and new concepts with commercial potential;
- the supply of experienced management; and,
- the supply of knowledgeable and patient equity.

The policy recommendations in this report, therefore, focus on the role the B.C. government could play, in partnership with private investors, in a process of addressing these three difficulties for Knowledge-Based Companies.

SPARK Fiscal Committee
Final Report

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TABLE OF CONTENTS

chapter		page
I.	EXECUTIVE SUMMARY	1
II.	RECOMMENDATIONS IN SHORT	3
III.	BACKGROUND TO THIS REPORT	5
IV.	FISCAL COMMITTEE CONCLUSIONS AND POLICY RECOMMENDATIONS	25
V.	A PROGRAM TO DEVELOP AND COMMERCIALIZE NEW TECHNOLOGY	31
VI.	PROGRAMS DEVELOPING A POOL OF SUPERIOR MANAGEMENT RESOURCES	37
VII.	PROGRAMS BUILDING A POOL OF KNOWLEDGEABLE EQUITY	45

EXECUTIVE SUMMARY

The industries which have traditionally generated wealth in the Canadian economy have been based on natural resources. The fundamental terms of trade are now turning against natural resource-based economies, due to two coincident trends:

- Growing environmental awareness in our own society is leading to restrictions on access to resources and increased extraction costs.

- The same new awareness in international markets, teamed with technological progress, has lead to greater acceptance of lower cost substitutes for the natural products we export.

The two fastest growing industrialized states — Japan and Germany — do not rely on a large storehouse of resources. They are taking the lead in affecting and adapting to structural changes in the global economy through which wealth generation is more and more derived from a base of knowledge, rather than natural resources or cheap labour.

Recent studies by Professor Richard Lipsey[1], Dr. Sylvia Ostrey[2] and others suggest that technological innovation has been the primary generator of wealth for many generations now, even among resource-based economies. Technology has been the engine for a lifetime of productivity improvement, particularly in resource-rich nations. However, in recent times, the rate at which productivity gains have been demonstrated in resource-rich economies has slowed compared to the rates of productivity increase in many less naturally well-endowed economies. In order to succeed in the global marketplace of the future, Canadian businesses must continue to improve productivity relative to their international competitors, add greater value to the

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1 Lipsey, Richard G. "Economic Growth: Science & Technology and Institutional Change in a Global Economy. Preliminary Outline", **Canadian Institute of Advanced Research Publication No.4**, May 1991.

2 Ostrey, Dr. Sylvia, various speeches in 1989 and 1990 and personal communication to the SPARK Fiscal Committee.

products they sell, reverse the trend towards over-consumption of natural resources and diversify their base. Ongoing investment in technology and Knowledge-Based Companies ("KBCs") is essential to our future economic livelihood.

A ready supply of experienced equity must be considered only as one of three highly related critical elements that lead to success in the formation of KBCs. These elements are:

- **superior research;**
- **superior commercial management talent**; and,
- **knowledgeable equity.**

Like the three legs of a stool, these factors must be built in proportion with each other. They are dependent on each other. We believe it should be a target of government policy that the B.C. Knowledge-Based business sector achieve critical mass, the level of business activity at which the critical sources of competitive advantage are self-sustaining. This will not happen if government agencies provide businesses with unfocused funds. We need centres of technical excellence, knowledgeable risk equity and the best of managerial talent in the right combinations, to develop a new base for growth through Knowledge-Based Companies.

RECOMMENDATIONS IN SHORT

Specific policy and program recommendations, organized under the three factors for success, are summarized below.

Development and Commercialization of New Technologies

The SPARK Fiscal Committee recommends that:

the Province of British Columbia establish a new private company with a mandate to

- **maximize the commercial value of technologies developed at universities and in other publicly-funded research facilities in B.C.; and,**

- **promote the interaction between industry and research institutions for the purposes of technology transfer.**

Development and Maintenance of a Pool of Superior Management Resources

The SPARK Fiscal Committee recommends that:

the Province of British Columbia participate in an aggressive initiative to attract more senior managers from other jurisdictions and from other more secure working environments, through

- **provision of a two year provincial tax holiday for persons coming from outside B.C. to fill management vacancies in Knowledge-Based Companies;**

— provision of direct loan assistance to Knowledge-Based Companies to spread the burden of relocation and recruiting costs over a management settling period; and,

— urging the federal government to provide the $500,000 capital gains exemption only to employees who own equity in their Knowledge-Based Companies.

and the Province of British Columbia establish an active program to encourage B.C.-trained technology managers and researchers living elsewhere to return to B.C.

Development and Maintenance of a Pool of Knowledgeable Equity

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The SPARK Fiscal Committee recommends that:

the Province of British Columbia, in partnership with the private sector, invest in a series of new venture capital funds, which in turn will invest in KBCs; and

the Province of British Columbia provide matching investments for high potential/high value-added KBCs which raise significant amounts of permanent equity from the private sector.

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The rationale for and the objectives and anticipated net benefits of these program recommendations are described in the remaining chapters of this report.

BACKGROUND TO THIS REPORT

Canada Is At Economic Crossroads

> *"Canada is a small peripheral economy competing in an increasingly complex global system driven and changed by the merging of science and technology.*
>
> *...we must make a major switch from a resource-based economy to the knowledge-based economy (capable of producing tradeable goods and services), which is necessary to compete and maintain an appropriate share in the expanding global economy."*[3]

Dr. Mustard's concerns are particularly applicable in British Columbia, where secondary product processing is often limited to short run, highly specialized niche-market manufacturing.

Our natural source of competitive advantage is now seriously threatened. Growing social concerns regarding the environmental consequences of our primary industrial practices are closing the door on unrestricted access to non-renewable and renewable resources. At the same time, Canada has an increasingly negative balance of trade in typical knowledge-based products.

As illustrated in **Exhibit 1**, long run average prices are eroding for virtually all the key Canadian export commodities, especially wood, wheat and fish, where there is little value added in Canada. This reduction in commodity prices is a global phenomenon, and one over which Canadian producers have no control. For its resource sectors to prosper, British Columbia has to move towards the development of better quality resource products and services that can continue to compete in the international marketplace. And the Committee believes that diversifying into the industries key to the new global realities will be crucial if succeeding generations of B.C. citizens are to maintain a privileged standard of living.

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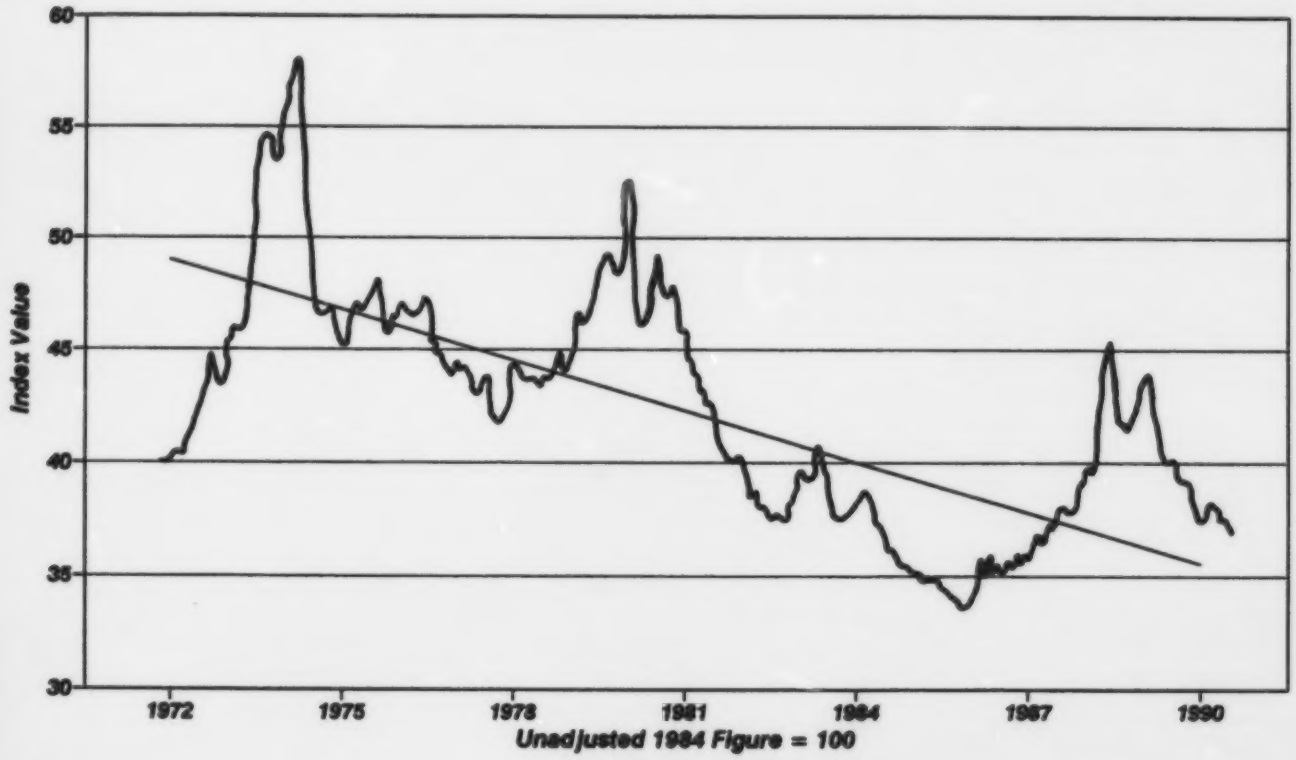
[3] Dr. Fraser Mustard, **Canadian Institute for Advanced Research**, at the Halifax Forum, 1988.

Exhibit 1 Principle Commodity Exports All-Commodity Price Index (Inflation adjusted)



Source: Scotiabank Economics

This movement can be achieved through:

- development of new processes that will reduce resource consumption by increasing production efficiency, while reducing process costs and rates of natural resource consumption;
- development of new, higher value-added products and services; and
- diversification of the industrial base of B.C.'s economy to make it competitive in a global economy increasingly driven and dominated by technological innovation.

In the industrialized world economy, research, technological innovation and knowledge have been the keys to the generation of wealth. However, in Canada, innovation has typically been viewed as an incidental or even inevitable (sometimes undesirable) part of the industrial process. But in the longer term, innovation *drives* wealth creation. If we do not succeed in reorienting our economy towards innovation, the negative impact on our competitive position in world markets, and our living standards, will be gradual but severe.

Strategies for Innovation Were Introduced in 1988

In October, 1988, the Premier of British Columbia announced a Provincial "framework for a prosperous future for British Columbia, where science and technology play a vital role". Among other things, the Province committed "to provide a level of direct government financial support for technology-intensive industries that will enable British Columbia to be competitive nationally and internationally".

Following this announcement, the Science Council of B.C. sponsored the SPARK[4] initiative. Subsequently, SPARK Fiscal Committee was formed to look at the problem of equity supply for Knowledge-Based Companies,

[4] Strategic Planning for Applied Research and Knowledge ("SPARK") is an initiative that brings together leaders from various industry sectors to identify prospects and recommend measures which will ensure that these are realized.

particularly in early stages, and to recommend actions that the Province of British Columbia could take to support the development of high value added/high potential return production and services in B.C. Specifically, SPARK Fiscal Committee was invited to recommend actions that the Province could take to support the creation of the kind of financial climate in which the objectives of the new science and technology policy are more likely to be achieved.

SPARK Fiscal Committee Has Focused on a Knowledge-Based Industrial Strategy

The SPARK Fiscal Committee's mandate is to focus on sources of equity for early stage knowledge-based businesses. In a 1990 report, **Venture Economics Canada**[5] collected data which demonstrates that technology or knowledge-based businesses currently had the highest overall growth potential in North American economies (**Exhibit 2**). The growth potential of the U.S. industry appears to be much higher than it is for comparable Canadian industry.

Individual Knowledge-Based Companies have high risk/reward profiles. Those in Canada do not appear to attract the level of private sector investment required to achieve their potential. Alternative sources of capital include institutional lenders and government.

The Canadian financial institution structure is deficient, especially compared to other jurisdictions. This comment is expanded later in this report.

While we have witnessed large proportionate increases in government participation in early stage businesses, governments are not in a position to take up the full slack left by the private sector (let alone fuel growth in KBCs). Another problem is that government venture capital investments do not appear to attract new private capital, thereby limiting the multiplier effect as

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5 **Venture Economics Canada** was a Toronto-based consulting firm that specialized in the study of the venture capital industry and markets in Canada and the U.S. The firm ceased operations in Canada in early 1990.

the capital supply market shifts. To achieve the multiplier effect and to improve the availability of funds, new policy must encourage private investment in B.C., not only from institutions, corporations and individuals within the Province but, perhaps more importantly, from external sources.

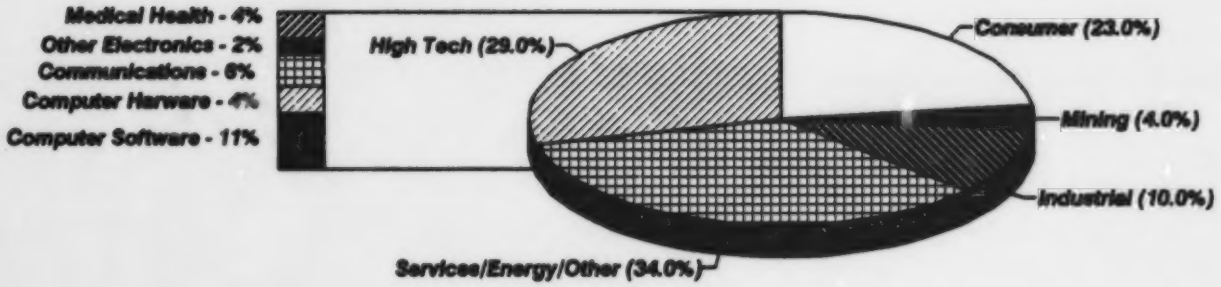
Any strategy to develop a high value-added economy will logically be oriented towards knowledge-based industrial growth. Currently, directories of the top and fastest growing Canadian companies still demonstrate a concentration of business revenues and investment in our primary resource extraction sectors, and in secondary industries that are entirely dependent on primary resources.

For purposes of this discussion, a Knowledge-Based Company is defined below:

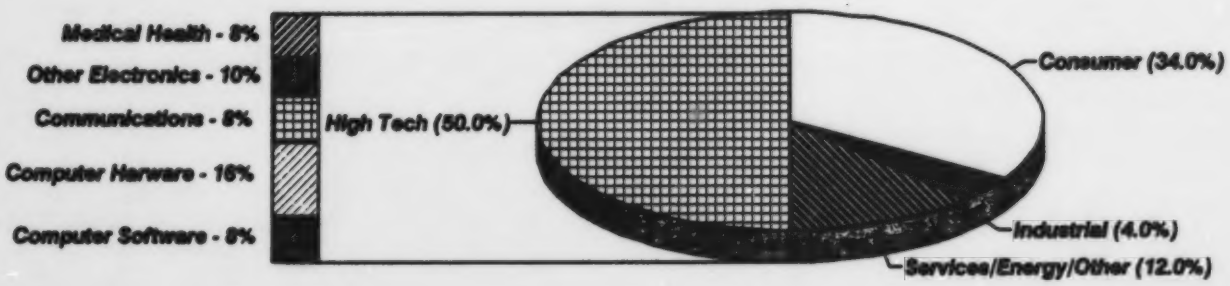
> A Knowledge-Based Company ("KBC") is a commercial organization which:
>
> - has as its business objective the development, marketing, manufacture or delivery of a technologically advanced product or service;
> - is primarily dependent for its success on the application of technology, developed through its own research or on research acquired from others;
> - during its concept and start-up stages (prior to establishing manufacturing, sales or the delivery of services) spends at least one-third of its total annual expenditures on research and development and thereafter a significant portion of its revenues on research and development.

The original draft of this report was criticized because it did not extend the benefits proposed for KBCs to more traditional resource-based industries — specifically mineral prospecting and "manufacturing". The first exclusion is deliberate because the wealth generating economy of the next century will de-

Exhibit 2 Primary Business Activity of 50 Fastest Growing Public Companies, 1984 - 1989*



Canada



U.S.A.

* As defined by INC Magazine for U.S. sample and Canadian Business Magazine for Canadian sample.

emphasize primary resource extraction activities in favour of Knowledge-Based economic activities. As for the latter, SPARK Fiscal Committee believes that many manufacturing businesses will only survive if they introduce more advanced, indeed "knowledge-based" technologies to the manufacturing process. Finally, Knowledge-Based Companies cross industrial boundaries. A policy oriented towards the support of KBCs will foster products or services that will also add value to B.C.'s traditional industries.

The Three Critical Sources of Competitive Advantage in a Knowledge-Based Company

There are three highly related critical elements that lead to success in the formation of KBCs. These elements are:

- **superior research talent and facilities** through which technologically advanced new products or services can be discovered and harnessed for development into world-class commercial opportunities;

- **superior managerial talent** to manage these opportunities and the resources assembled for commercializing them;

- sources of equity funds with experience in guiding and investing in KBCs, herein referred to as **knowledgeable equity.**

These sources of competitive advantage are analogous to the three legs of a stool. All three must be strong and in proportion for the stool to stand. To be effective, fiscal policy needs to recognize the interdependencies of these sources of competitive advantage, and provide simultaneous support to all three legs of the stool.

A crucial conclusion is that the supply of equity cannot be addressed as an independent variable. At the level of the firm, new equity will only generate a return if the management team is experienced and competent enough to marry technology to market demand, and to assemble the appropriate mix of people to execute a well-conceived business plan. Put another way, over-emphasizing one element (e.g. academic research), while not

paying adequate attention to another (e.g. attracting top grade managerial talent) may result in "wasting" resources.

In the Fiscal Committee's view, research talent is available in British Columbia. This resource requires more market focus and organization, and is badly in need of support from the other two "legs".

In the more traditional industries, founders often can trade off time for money. Primary resource investments (especially mines) and tourism plant, for example, typically have long marketable lives (over twenty years). While these businesses are cyclical in nature, an operator with adequate funding can survive and eventually prosper while learning how to manage the business and developing an understanding of key markets.

For a KBC the marketable life of any one technology or knowledge-based product can be as short as twelve months and rarely exceeds a few years. The product must be launched rapidly to capitalize on its initial competitive advantage, and then must be enhanced, expanded and remodelled to incorporate market-directed improvements. This pace is faster than for most traditional businesses, and reduces the time available to inexperienced business managers to develop proficiency in management as well as market expertise. Available funds must be immediately dedicated to recruiting and remunerating managers that have already made their way up the learning curve. This involves bringing in experience and expertise from outside the Province until the local supply of experienced managers has been better established.

We Need To Achieve a Critical Mass of Knowledge-Based Companies

We anticipate that both public and private spending on KBCs will continue to be insufficient until there is a certain critical mass of companies and knowledgeable equity. A number of major start-up costs, including the costs of recruiting and maintaining superior management and technical teams, will be reduced for all companies once critical mass is achieved.

Professional recruiters have reported that, even when they are able to offer competitive terms to potential managers for their KBC clients, it is

difficult to convince candidates to move from established roles in old-line companies to insecure roles in smaller B.C. companies with high risk profiles. There is already substantial immediate risk associated with the move—a new city, often a new country and a new company without a track record. There is a perception of greater risk when the move is to a small community of KBCs. If the relationship with the new company does not work out, what are the new manager's local options? At this time, there are not enough other KBCs in the region, so the relative personal cost of failure is perceived to be very high.

Critical mass also reduces the investor's risk. Many of today's top performing businesses were not successful from their start. The 3M Company, for example, exhausted at least two rounds of managers and investors before embarking on the tradition of success for which it is well known today. A good product, concept or management team can realize its potential if there is an adequate supply and access to second and third round investors, as well as additional management expertise. When a region lacks depth in these resources, the perceived cost of a restart can be prohibitive, limiting the initial investors' options for recouping losses. With critical mass there should be lower relative costs of both start-up and restart. Investors should have a lower initial risk and some alternatives to recover from an unsuccessful launch of a new venture. They therefore are more likely to participate in a new venture in the first place.

Access to markets and people who understand them is important, and may be a key factor of success for tomorrow's KBCs. Unfortunately, Canada's tax structure makes it extremely difficult to attract such quality talent from other jurisdictions. This is leading to a new version of the "hewers of wood" scenario, in which technology originating in Canada is exploited elsewhere, especially in the U.S. There are examples of young companies moving their headquarters across the border, setting up their highest value-added employees in offices outside B.C., and leaving their R&D headquarters here. Crucial decision-making, therefore, gets done elsewhere, and we are left with the "worker drones". In the view of the Fiscal Committee, the various levels of government must address this trend, and we must all develop a better understanding of how knowledge-based wealth is generated in the long-term.

The concept of critical mass is as valid for venture capital as it is for KBCs. Good fund managers locate where they have access to risk capital and where there are deals to be made. Most large venture capital placements now

involve syndicates of investors. More now than ever, venture capitalists need to have close working relationships with other venture capitalists.

Current Well-Intentioned Government Policies Need Coordination, Simplification, Focus and Redirection

Existing science and technology policies support a range of product and process research and development funding programs. The existing systems of grants, loans and tax incentives is important, though perhaps overly complex. And science and technology programs, for the most part, appear to operate quite separately from business development programs.

In times of shortened product life cycles, "a product does not a business make". A new product can lead to the start of a new business. However, a single product business will rarely survive, even into the medium-term. It will be important to introduce increased understanding of business considerations in science and technology programming, particularly in the area of technology transfer.

Economic development policies, on the other hand, perpetuate the old economic order. Of Provincial government spending for business development in 1989, over 90% was allocated primarily to resource-based companies, with the lion's share going to the mining sector. However, it is estimated that B.C.'s resource sector is growing at an annual rate of 2% or less, while advanced technology sectors are growing at rates of 15% to 20% per year. Still, only a few B.C.-based KBCs have exceeded the $40 million annual sales level described by the Ontario Premier's Advisory Council as "threshold". Over the fall of 1991, the Province of British Columbia announced further intentions to support the flailing, environmentally-challenging coal industry, primarily for the sake of short-term job preservation. Clearly, economic development policy that is oriented towards strengthening the future economy will allocate public resources far more favourably in support of advanced technology-based businesses.

Existing business assistance programs tend to be uncoordinated and do not impose a leverage factor on funds invested. Future policy initiatives should

support the development of a common vision among funding agencies, in order to achieve adequate returns and encourage leverage on investments.

Uncoordinated policies and complicated program design have resulted in lower returns on provincial programming due to the "chicken and egg" nature of the key sources of competitive advantage described below.

- If companies have access to equity, but inexperienced managers fail to efficiently exploit opportunities, the pool of equity will dry up.

- A 1989 Peat Marwick study[6] found that inexperienced managers consistently underestimate the capital costs of growth, thereby making it even more difficult to exploit opportunities and achieve expected returns;

- It is difficult to attract experienced managers when companies are financed inadequately and, therefore, cannot offer internationally competitive management compensation.

- Key managers in the more successful KBCs tend to be risk takers, and therefore are willing to accept salary and benefit packages that are largely performance-based. But the personal tax system in Canada does not adequately distinguish between salary and capital gains for this type of manager, reducing his or her comparative return on taking risk. Finally, the performance history of Canadian KBCs has been poor, so the value of the packages we offer is still not perceived to be competitive.

With respect to the supply of risk capital:

- pools of risk capital tend to accumulate around successful fund managers;

- successful fund managers gravitate towards regions where they will have day-to-day access to the best potential investment opportunities, the best management talent and other successful fund managers.

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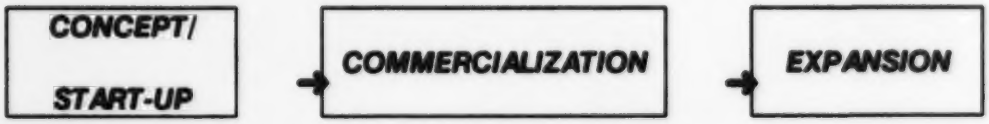
[6] Donnelly, Aldyen and Winslow, Douglas F., **Surviving in High Tech, Issues 1989: Facing Commercial Reality**, © KPMG Peat Marwick, May, 1989.

Venture Economics Canada, among other research organizations, has demonstrated that successful venture capital fund managers (who "succeed" because their investments succeed) take a hands-on interest in day-to-day decision-making in their companies. In view of the need for this commitment, the first choice of successful fund managers will be to invest close to home.

Why Are Existing Equity Sources Inadequate?

In the formative years, businesses progress through a continuum of phases as illustrated below:



It is the apparent shortage of early stage and commercialization phase equity funding that the SPARK Fiscal Committee has addressed. In the concept and start-up stages, the risks to the investor are very high and the prospects of the venture are largely unmeasurable. A company in commercialization, which has likely secured a patent, produced and tested a prototype and identified a target market, needs to re-test the product in the marketplace, re-engineer it, implement a marketing plan, arrange for production and distribution, and launch the product. While risks to the investor are reduced, they are still substantial, and valuation is still very difficult.

Existing private funding sources tend to focus on expansion and later phases of a company's life, although some start-up companies look to public exchanges as sources of capital. Government funding sources, including agencies/programs such as the federally-sponsored Western Economic Diversification Office (WEDO), provincially-funded Discovery Enterprises, and other programs that have been cost-shared under the federal/provincial

Economic and Regional Development Agreement (ERDA), are designed to direct their attention to research and development of specific projects during the concept (pre-commercialization) phase. However, they sometimes provide funds that protect jobs in mature businesses with declining markets; in effect delaying adjustment in some of the more traditional and dysfunctional portions of our economy.

Commercialization is a difficult phase to fund from government sources through existing programs, because many of the costs are soft and not discreetly identifiable. This makes qualifying and monitoring the expenditures of applicants a very difficult process.

- ***The Public Market***

Considering only early stage financing, neither national nor regional stock exchanges have played an effective role in financing Knowledge-Based Companies. However, for companies that are still small but well past their start-up and commercialization phases, the brokerage firms that are members of the stock exchanges and/or the Investment Dealers' Association of Canada have effectively raised capital. This financing, arranged by the investment banking or corporate finance departments of the brokers, is largely placed privately, and therefore there is no public record of the amounts involved. We are informed that financing in the $500,000 to $3 million range per deal, both equity and debt, has been raised through this channel for a substantial number of Western Canadian corporations.

Because it entails greater risk, earlier stage financing should provide a much greater reward. Yet the brokerage community, working with direct placements or with companies to be listed on an exchange, has not been effective in raising this type of funding. Factors that serve to inhibit the financing of start-up situations by the pools of capital with which the brokerage firms are in contact include problems surrounding:

- assessing risk;
- effectively monitoring the progress of a company;
- maintaining a position of control to meet the potential need to replace management; and,

- tying up funds for an unknown time horizon.

It would seem that a stock exchange listing could benefit an early stage Knowledge-Based Company. Some institutional investors can only invest in listed securities. RRSP accounts have this restriction. So, why would the public offering of shares to be listed on a regional stock exchange not be an effective solution to early stage financing? Two basic issues are discussed below.

1. A market can not be created for a small offering of shares.

First, the amount of money to be raised at any one time is too small to create enough marketable shares to support an orderly market. If the market does not develop naturally through the interaction of a large number of potential buyers and sellers, then the spread between the bid price and the offering price will only be attractive (leading to trading activity) if a promoter or a professional market maker is actively involved. This stimulation is usually withdrawn after a brief period and then the shares become inactive, lose their marketability and diminish in value.

The minimum size of an initial public offering of stock that would be large enough to create an orderly market is not something that can be measured precisely. Under some circumstances, the amount might be as low as $10 million, but it is probably closer to $25 million. The evidence in Canada is that stocks with a total market capitalization of $25 million or less trade erratically in limited volume unless that company is resource-based and involved in a potentially exciting stage of development.

2. Early stage Knowledge-Based Companies can take to long to show progress.

The second major issue associated with financing a start-up Knowledge-Based Company with shares to be listed on a stock exchange, is that it takes too long for these companies to exhibit the kind of corporate progress that appeals to unknowledgeable investors. These companies can take years to complete research and product development phases and they often face many failures and set backs in the process. They can then take several years to successfully market the product and

generate a profit. The key value of the stock exchange listing is that it creates marketability, enabling investors to act on a decision to buy or sell. If the company is not producing the kind of news that leads to these decisions, then that marketability adds no value.

Knowledge-Based Companies that have made a public offering of stock to finance their early stage development, involving a stock exchange listing, have then had to attempt to satisfy their investors by generating publicity and excitement about the progress they are making. Such promotional activity distorts the goals of managers, making them more short term in their thinking than is desirable, and leads to investor disillusionment when the company inevitably faces the set-backs and delays that are characteristic of the KBC start-up or commercialization phases.

Knowledge-Based Companies that have benefited from listing their shares on a stock exchange have been, almost without exception, at an advanced stage in their development at the time of the initial public offering. Typically, the amount of money involved has been many times the amounts sought by start-up organizations. Among the small number of KBCs that have issued a public offering of stock when in the start-up phase, many have seen their stock lose the attention of investors and decline to a low price that handicaps raising additional equity capital. Of course, there are exceptions, but these are few.

- ***Venture Capital Funds***

B.C. has a small number of teams of adequately funded managers, with limited resources. Ventures West, for example, is a major private source, but it has limited liquidity for new holdings. The Federal Business Development Bank Venture Group is also liquidity constrained. B.C. government-funded Discovery Enterprises has significant committed capital (over $50 million), but some of the terms of its B.C.-only investment policy make it difficult for the companies it invests in to succeed. However, some of the best of the B.C.-based technology firms have been backed, including Ballard Power Systems, Bedford Software, Consumers' Software, Epic Data, MDI, MDA, Nexus Engineering, Spectrum Signal Processing and others. It is perhaps surprising that few of these successful B.C. KBCs are currently publicly traded.

- ***Pension Funds***

There is a highly-regarded community of professional pension fund managers located in B.C. But, with one or two notable exceptions, few invest their clients' funds either in venture capital funds or more directly into early stage businesses. The largest pension fund source of all—approximately $18 billion from Crown and Crown-related employees—currently has a policy which prohibits such investing.

However, the Fiscal Committee is pleased to report that the B.C. government has recently contracted two private venture fund management companies to participate as partners in the establishment of two new venture funds in this Province. By offering matching private sector investment from the B.C. Privatization Fund, the Province has directed these managers to apply private sector investment criteria and business principles while targeting investment in B.C.-based KBCs.

In Ontario, a major source of risk equity has been the major pension funds held on behalf of provincial and crown corporation employees — funds such as OMERS and Ontario Hydro. The Fiscal Committee hopes that positive experiences with the Privatization Fund partnerships will lead B.C. to consider the application of a small portion of provincial and crown employee pension funds in similarly-targeted venture fund partnerships.

- ***Provincial Government Business Funding Programs***

Subsequent to the publication of the SPARK Fiscal Committee's draft report, the past Premier of British Columbia announced that all provincial government business incentive programs would be frozen subject to administrative review. While some programs, including the Employee Capital Program (through which Small Business Venture Capital Corporations—SBVCCs—are authorized) and the Employee Investment Program (EIP), were released from the freeze within one week of the announcement, others are still virtually inactive. We believe it likely that most programs will undergo additional review over the next few months, as a normal part of the indoctrination of the new government and its ministers.

With this in mind, the Committee offers the following comments in the spirit of constructive criticism. Originally, it was hoped that some diversified

venture capital funds would be established under the SBVCC rules, and the B.C.-based KBCs would benefit. However, less than 25% (42/194) of SBVCCs are established as blind funds with multi-purpose investment intentions. These funds had raised approximately $17 million by mid-1991 and invested $6 million to date. The vast majority of SBVCCs are single projects and, while SBVCC success stories have been reported in other industrial sectors, no threshold-level (sales over $40 million) KBCs have resulted.

While some VCC investments are packaged as income tax reduction products, the tax benefits provided through the program are not sufficient to attract investors who are not directly interested in the business deal being offered. However, the Fiscal Committee sees little evidence that the program has directly resulted in an increase in the participation of knowledgeable investors in Knowledge-Based Businesses in B.C.

Each project provides limited capital, and many of the professional advisors we have interviewed have suggested that the approval process is lengthy and difficult. It is also significant that, in spite of provincial efforts to include the federal government in the program, the tax benefits do not extend beyond B.C. taxpayers. While the program has not been running long enough to be judged conclusively, no potentially world-class KBCs have resulted.

A number of KBCs explored the concept of raising equity through employee ownership soon after the passing of B.C.'s Employee Investment Act and the introduction of the Employee Share Ownership (ESOP) and Employee Venture Capital Corporation (EVCC) Programs. Many new knowledge-based companies that originally considered the introduction of a provincially-qualified ESOP have failed to carry the plan through due to perceptions of liquidity issues. In some cases, however, non-government-assisted ESOPs are proceeding, and we understand that a number of plans are being developed for provincial registration.

One qualified employee venture capital corporation exists in British Columbia, as recently announced by the Province and directors of the Working Opportunities Fund ("WOF"). We are cautiously enthusiastic about this initiative. As we understand it, WOF could be an excellent vehicle for supplying knowledgeable and patient equity to B.C.-based KBCs. However, this essential combination rarely results from tax-driven programs, as is the WOF. The managers of this fund could become critical participants in the

transition to a knowledge-based economy in B.C., as long as they operate in a manner that reflects the principles of successful venture fund management. In other words, they will need to participate directly in the day-to-day operations of their investees. In Quebec, where a similar fund exists, but a more traditional style of investment management dominates, the economic diversification effects of the fund appear to be limited.

Historically, the provincial government has assisted a number of businesses on an *ad-hoc* basis, usually in the form of low interest loans and/or loan guarantees. Information on this form of funding is not readily available on a transaction-to-transaction basis, therefore it is difficult to form an opinion as to its effectiveness. According to B.C. government reports to which we earlier referred, less than 10% of this form of assistance reaches "high technology" companies, even though investment in this sector is investment in our future.

- ***Federal Government Loan Assistance Programs***

Loans from the Western Economic Diversification Office are often viewed by small companies as substitutes for equity. While WEDO appears to have a positive impact, historically it has substituted individual project assessments—often lengthy and complex—for the market-based judgements of the private sector. That is, the methodology often does not lead to the intended additional injection of private capital into client companies. However, professional advisors that were interviewed by the Committee's representative have indicated that a more stringent interpretation of matching equity is being applied of late, and the apparent leverage factor on WEDO funds is increasing.

It has also been reported that the calculation of eligible funding levels on an asset basis leads to complicated and costly accounting and reporting requirements, and does not encourage recognition of the high soft cost component of building a successful business.

- ***Large Corporate Investors***

Few large corporations in B.C. (again with some exceptions, such as B.C. Telephone or Prism Corporation) have formal programs to invest in or become corporate partners with KBCs. Anecdotal evidence suggests that corporations most inclined to participate in such partnerships tend to be early

adopters of new technology, if not large technology developers in their own right (such as Microsoft, Lotus Development Corporation, etc.). We have already pointed out that no such large technology company yet exists in B.C.

The reluctance of B.C.-based resource companies to invest in and later adopt new technologies is an area of concern. The Prime Minister's Forest Sector Advisory Council (FSAC) has commissioned a number of studies over the past few years, all of which describe Canadian industry as well behind competing international counterparts in our rates of innovation and capital reinvestment. The FSAC and other studies suggest a direct causal relationship between our slow rate of innovation and poor relative productivity rates, as well as some recent loss of share in international markets. In an analysis of US technology programs[7], the US Council of State Policy and Planning Agencies found that a high relative rate of innovation or capital reinvestment in traditional industries is important to the successful development of a knowledge-based sector. A slow relative rate of innovation not only holds back the knowledge-based sector — it holds back the economy as a whole.

There is some progressive private capital, and an abundance of "sweat equity", or the underpaid efforts of entrepreneurs. Companies such as Dynapro Systems Inc., Columbia Computing Systems, Basic Software (which became part of Computer Associates) and Glenayre Electronics have managed to carve out important niches and exceed the 100-employee level. But how much better might they be able to do with more diversified, knowledgeable capital available? How many companies never made it? How many would have made it in a jurisdiction with adequate infrastructure to meet their needs during the early years of commercialization?

- ***The Canadian Financial Infrastructure***

As is evident from many other reports (such as the report from the National Advisory Board on Science and Technology Financial Committee), there is a serious gap in the institutional financial structure in Canada. This gap is in assistance to KBCs in general and for the purposes of product

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[7] Mr. David Osborne, for the Senate Council of State Policy and Planning Agencies, **Technology Programs: A Preliminary Analysis of Lessons Learned**, November, 1989.

commercialization in particular. With one exception—the Toronto Dominion Bank—none of Canada's chartered banks are preparing to address this gap in any formal way. Generally, the banks argue that the risks associated with such lending or equity investment are too high, or that this type of financing is outside their perceived mandate.

Similarly, KBC investment efforts by the other two major institutional players—pension fund managers and life insurance companies—are not organized, generally ad hoc, and support little in the way of intermediaries.

FISCAL COMMITTEE CONCLUSIONS AND POLICY RECOMMENDATIONS

The major conclusions and recommendations of the SPARK Fiscal Committee address the need for public participation in the development of a self-sustaining supply of:

- ***superior research***;
- ***superior commercial management***; and,
- ***knowledgeable equity*** for early stage companies.

New Policy Should Focus on a New Economic Order

Building policies that will positively effect growth in an effective way is difficult. B.C. policy-makers, like many others, have historically reduced the task by addressing issues separately: through specifically-focused initiatives like science and technology programs, business development programs, or education programs. This separation often leads to an uncoordinated policy set, and reduced returns on government's investment in economic growth.

SPARK Fiscal Committee recommends that the Province of British Columbia introduce a coordinated Policy for the Development of Knowledge-Based Companies. This coordinated policy would create a base for programs focused on improving productivity and the diversification of economic activity with emphasis on the production of higher value-added products and services in British Columbia. Provincial government assistance programs should assign priority to private sector initiatives that develop and support tripartite partnerships that include government, academic institutions and industry.

KBCs are found in virtually all industry sectors. The SPARK Fiscal Committee believes the "knowledge-based" concept should extend beyond the usual definition of "high technology"—such as computers, electronics,

biotechnology—into companies whose products or services add value or increase productivity in B.C.'s more traditional industries.

These objectives are not necessarily inconsistent. The survival of regional subeconomies will ultimately depend on movement away from primary resource-based production in the near term. In addition, many KBCs are less location sensitive than resource-based companies, and can be successfully developed on a regional basis.

In order for North American businesses to compete globally, our governments have to continue their participation in the venture capital marketplace—and need to get better at levering on the dollars invested. As illustrated in **Exhibits 3 and 4**, private venture capital investment in early stage businesses declined almost 40%. In a confidential study completed in March, 1991, **Venture Economics Canada**[8] found that "in Canada, the number of active venture capital groups has [also] fallen by 40% since 1987, and all of this decline has been in the private sector.

"Private sector technology investors in Canada now manage about 30% less capital than they did just four years ago...Canadian venture capital companies that specialize in technology investing now collectively have only $100 million available for investment." While large proportionate increases in government and crown-related participation are also taking place, governments are not in a position to take up the full slack, let alone fuel growth in Canadian KBCs.

The study found that public sector and crown or labour-related "hybrids" that will consider technology investments currently administer about $400 million in uncommitted capital. However, "even this relatively small pool of capital is constrained for investment purposes by regional investment restrictions...This regional focus means that only $154 million of uninvested capital plus about $30 million per year in [total private and public sector] allotments is available to technology opportunities outside of Alberta and Quebec. Of this, only about $78 million plus about $20 million per year is managed by firms specializing in technology investments."

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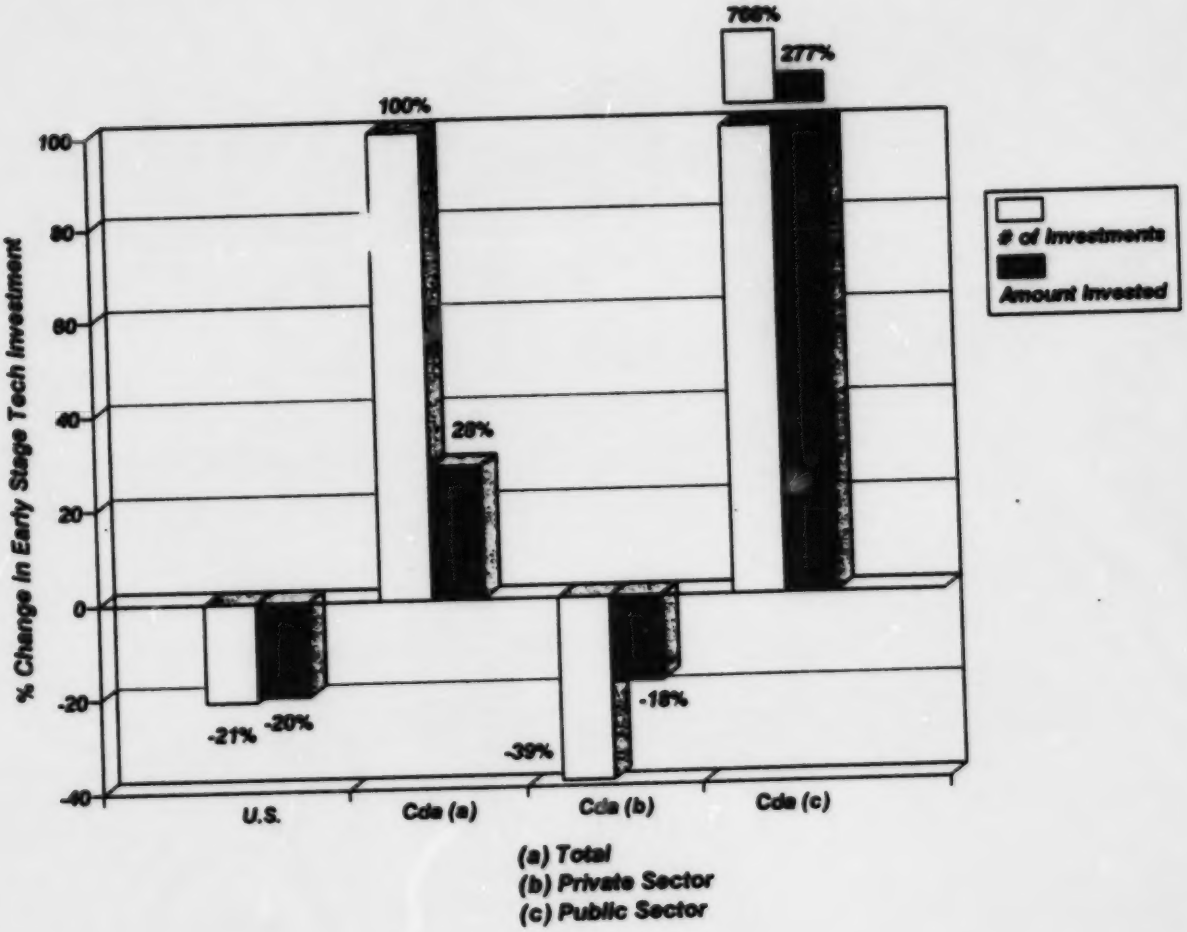
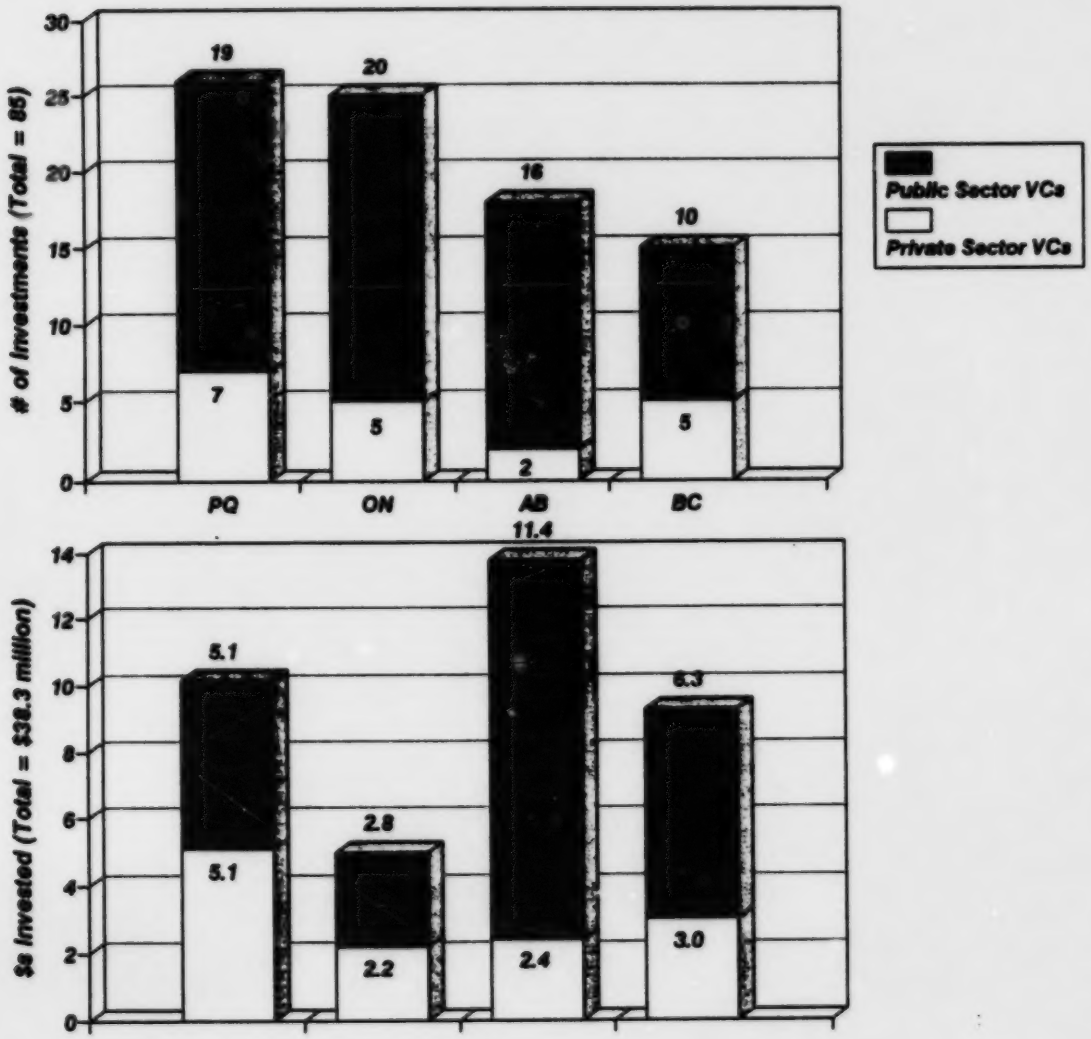
8 Venture Economics Canada, in a private study completed for **Ventures West III Limited Partnership**, March, 1991.

Exhibit 3 Growth in Early Stage Technology Investing (% Change in Early Stage Technology Investments, 1986-1988)



(a) Total
(b) Private Sector
(c) Public Sector

Exhibit 4 Regional Investment Profile (# of Investments and $ Invested, first 9 months, 1989)



By comparison, SPARK estimates that B.C.'s Information Technology sector alone will need to consume up to $15 billion in assets (primarily equity) between now and 1995, to maintain a 12% to 15% annual growth rate over that period.

We Propose a Substantial Commitment to Change

In the following chapters, we outline a number of specific program recommendations. The SPARK Fiscal Committee has prepared preliminary economic models in order to roughly estimate potential costs and benefits for each program. On the basis of these program outlines and preliminary analysis, we estimate that the Province of B.C. could commit between $300 and $400 million over the next five years towards the development of the three legs of the new knowledge-based economy.

We do not anticipate that these recommendations will require a significant injection of new tax money into the system. We believe that the Committee's recommendations could be funded primarily through redirection of existing business development and science and technology program funds and manpower allocations.

Many of the proposed programs should become operationally self-supporting between years five and eight. The economic payback period for the entire set of programs is estimated at between 10 and 12 years. While this estimated payback does not meet average private industry return criteria, it is appropriate for public programs where there is incremental value.

This is a major and closely focused commitment. Most of our specific recommendations limit access to proposed assistance to eligible Knowledge-Based Companies.

Three types of assistance are envisioned: loans, tax incentives and matching grants. The public funds required to support these recommendations could come from a number of sources:

- The introduction of new policy should result in a shift in both the mandate and distribution of existing business development loan programs, away

from support of primary resources extraction activities towards high return/high value-added production and services. This will cause a relative reduction in assistance to the forestry and mining sectors (currently the largest recipients of provincial business development funds). The degree of redistribution of assistance among industries will depend entirely on the level of new investment made in new processes, technologies and knowledge-based activities within each industrial sector.

- Successful income tax incentive programs should generate increases in general sales and corporate income payments. Therefore, no net new public funds should be consumed. Any special capital gains tax exemption will be approved on the basis that it will stimulate investment where such investment is currently lacking. Therefore, capital gains taxes are not currently being generated and the concept of foregone tax revenues will not apply.

- With respect to matching equity programs, new sources of funds need to be considered, at least at the outset. One source might be the Privatization Benefits Fund; others are the provincially administered pension plans.

The SPARK Fiscal Committee is not recommending the redirection of Science and technology funds that are currently earmarked for product and process development. Funding of this sort is critical to the current strength of the first leg of the stool — good research and new commercial ideas. However, "a product does not a business make." New policy should recognize the difference between providing support for new ideas and product development, on the one hand, and seeding new business development, on the other.

A PROGRAM TO DEVELOP AND COMMERCIALIZE NEW TECHNOLOGY

British Columbia has made significant progress in encouraging world-class technology research. However, the development and commercialization of resulting technology is *ad hoc*, uncoordinated and not likely to provide maximum financial return to either the creators of new products and processes or the Province. The result is a commercialization process that is supported by "technology push". In the Fiscal Committee's view, the technology development and commercialization process needs more "market pull".

Knowledge-Based industry in B.C. may be established from three sources:

- commercial application of successful research that is developed privately or in academic institutions;
- attracting technology development companies to the Province; and,
- technology transfer.

It will be necessary to be active on all three of these fronts, but the immediate need is to focus on the first.

Program Recommendation 1

THAT THE PROVINCE OF BRITISH COLUMBIA ESTABLISH A NEW PRIVATE COMPANY WITH A MANDATE TO

- ***MAXIMIZE THE ECONOMIC VALUE OF TECHNOLOGIES DEVELOPED AT UNIVERSITIES AND IN OTHER PUBLICLY-FUNDED RESEARCH FACILITIES IN B.C.; AND,***
- ***PROMOTE THE INTERACTION BETWEEN INDUSTRY AND RESEARCH INSTITUTIONS FOR THE PURPOSES OF TECHNOLOGY TRANSFER***

In a 1989 study of U.S. State-sponsored technology programs[9], the Senate Council of State Policy and Planning found that an independent, arms-length technology transfer organization is in place in all of the jurisdictions where technology programs appear to be operating successfully. The study suggests that organizations "whose operations are oriented towards brokering projects between one or more firms and one or more universities or federal labs, with the organization acting as matchmaker", that focuses on identifying research "that addresses near-term industrial issues" have the best records of success. For purposes of the study, success was defined as significant contribution to economic development (local business increase in contribution to GDP) within the funding jurisdiction.

The same study found that there are as many as six structural models that the organization can follow. Success rate does not seem to particularly follow one structure or another. However, an international comparison found that highly specialized organizations (i.e. in biotechnology, space science, particle physics, etc.) with a mandate to monitor scientific developments within a given specialty and which brokers them locally, lead to highest rates of new product commercialization (the Japanese model for technology transfer).

Universities, Institutes, the Province and the Private Sector Should Participate as Equity Holders

The SPARK Fiscal Committee recommends the incorporation of a company, which we will refer to as the University Enterprises of B.C. ("UEBC"), for purposes of this discussion. UEBC would be owned by participating universities, interested science-based institutions, and the private sector. The goal of the company would be to attain a high level of sustained profitability.

- ***The Model As Originally Envisioned by SPARK Fiscal Committee***

UEBC would be responsible for creating wealth for its owners from publicly-funded research in B.C. The University of B.C., Simon Fraser

[9] Mr. David Osborne, *ibid.*

University, the University of Victoria, TRIUMF and other institutions would encourage UEBC to negotiate with them and with individual researchers known to them. UEBC would work, in coordinating capacity, with university-based technology transfer offices and other related organizations, like the Advanced Systems Institute. UEBC would not be affiliated with one particular university or centre of high quality research activity.

Each university or participating institution would hold shares in UEBC. The company, working in a positive and proactive manner, would seek out commercial opportunities based on the research activities of the participating universities and institutions, bringing commercial expertise to the inventors and research facilities. UEBC will acquire product rights through project-by-project agreements with researchers, research facilities and universities. The company would have no obligation to projects it feels are not appropriate for commercialization.

UEBC would work in a collaborative spirit with existing University Industry Liaison Offices to:

- select projects of interest, and help them proceed through pre-commercial stages with various forms of assistance such as seed-stage funding;
- introduce possible early-stage venture groups, syndicates or larger corporate strategic partners for financing;
- take ownership positions in technologies and new ventures; and,
- assemble members of possible management teams.

UEBC's activities would be market-driven. The results should include faster rates of commercialization of technologies currently in development in our universities and centres of higher research (due to the introduction of private sector-type rewards and incentives), improved and/or earlier financial returns to professors/inventors for their efforts and a more effective combination of management, commercial expertise and financing possibilities.

The company is expected to attain a high level of sustained profitability after a start-up period of ten years. It was originally proposed that the Province of B.C. guarantee to fund UEBC at a level of $2 million per year for

a period of up to five years. UEBC would also be directed to raise funds from private investors, and would qualify for matching funds under the proposed provincial program described on page 49 below. The SPARK Fiscal Committee has estimated that this program should cost about $19 million over 5 years (combined operating assistance and matching funds) raising at least $9 million in matching private equity investment.

- ***A Key Change in Response to Public Input***

In the Fiscal Committee's first draft of this recommendation, which was reviewed at a public meeting last year, a provision that UEBC should have a right of first refusal to technologies which were the product of publicly funded research at universities of other institutions.

The inclusion of this provision in the recommendation generated intense discussions. As a result of those discussions, and of further investigations into the practises of agencies organized for similar purposes, we now recommend that the terms of access to technologies developed at public expense would be negotiated between the institutions and UEBC.

As UEBC would be owned by those institutions it is expected that the benefits of the UEBC commercialization process would become readily apparent to its owners, encouraging the owner/institutions to provide favourable terms of access. It is noted that in many of the successful agencies in the United States there is express or defacto preferential access to the technologies.

The objective of UEBC would be, on a demand-pull basis, to encourage the exploitation of technologies. The Fiscal Committee feels that this would be an improvement over the present "technology-push" *modus operandi* of the Province's existing technology transfer offices.

- ***The Pathways Model Could Be Developed Into a Program That Would Effectively Achieve the Goals of UEBC***

Earlier this year, in response to the original recommendation of the Fiscal Committee, the B.C. Ministry of Advanced Education Training and Technology contracted Dr. Denis Connor, formerly President of the Science Council of B.C. and currently Executive Director of ASI/Wireless Research, to develop

the concept of a for-profit technology assessment and seed-money investment corporation whose mission is:

> "To create viable, knowledge-based companies in B.C. from technology opportunities provided by B.C. universities, colleges, research institutes or the private sector."

The concept has been labelled the Pathways Pilot Project. In principle, the concept is derived from models operating in other jurisdictions.

Three constraints must be satisfied for the model to be successful:

- private sector investors must participate with some of their own funds, in order to bring a strong business orientation into the assessment of technologies and the investment of seed money in start-up businesses;
- technology opportunity providers must be confident that their interests and those to the private sector investors are aligned, and must be eager to participate;
- there must be a standard formula for allocating benefits once the dollar value of the technology opportunity, which has been developed and packaged with Pathways Corporation funding, is determined through a transaction in the venture capital market.

The Committee believes that the following factors should be preserved in the Pathways development plan for the model to be successfully introduced in British Columbia:

- strong leadership from both the business and university communities must be associated with the initiative;
- governments must be involved;
- universities must have an ownership position in the Pathways Corporation and a vested interest in the success of the Corporation; and,
- the initiative must result in the location of business experience and expertise on campus.

A tangible commitment from the universities and government to the success of Pathways will have to be visible from the start, in order to attract the support of private sector financiers.

PROGRAMS DEVELOPING A POOL OF SUPERIOR MANAGEMENT RESOURCES

Comparisons of technology-based companies in Canada with those in the United states make it clear that B.C. has a very limited supply of related industry and start-up managerial talent. The findings of one such comparison study, completed by **Venture Economics Canada** in early 1990, are illustrated in **Exhibit 5**. Many senior Canadian managers work in large foreign-owned companies in which they are insolated from crucial decisions on marketing and product development. Others work in our traditional industries where the marketing issues such as corporate positioning, technical obsolescence and service are largely non-critical. The result is a cultural bias for security over risk, which is encouraged by our tax system.

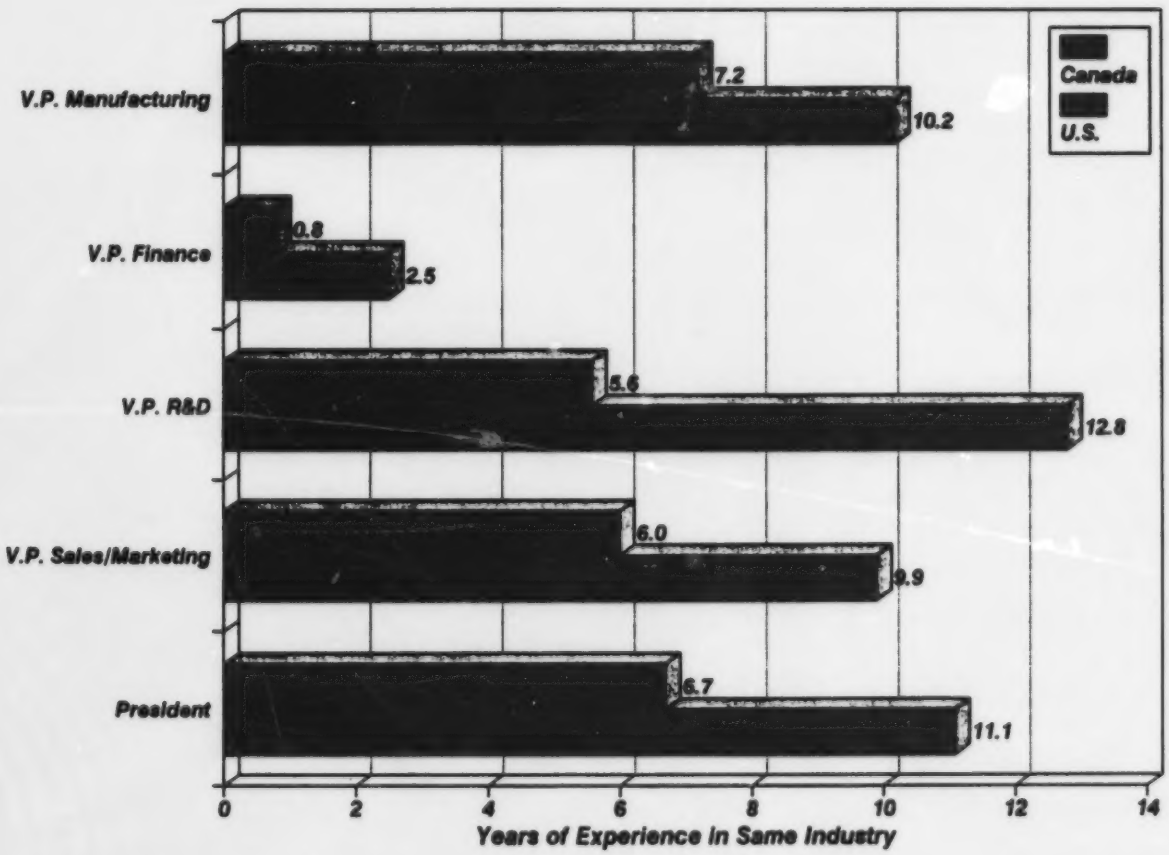
New Canadian companies and their managers, therefore, often spend time learning while the international competition performs. Successful B.C.-based Knowledge-Based Companies typically move offices south of the border when U.S. sales reach a certain level. Key differences in the tax system below the U.S. border result in a much better return on employment income for managers based outside Canada, including:

- less income tax;
- mortgage interest deductibility; and,
- special capital gains provisions.

It is unlikely that we will duplicate the Washington State income tax environment in B.C. However, the SPARK Fiscal Committee believes that returns can be realized on programs designed to attract and develop a pool of experienced management talent to British Columbia. Once the pool of B.C.-based management has sufficient size to become self-sustaining, B.C.-based corporate performance should improve, leading to better returns to managers and reduced incentive to move south.

While it may be ideal to "grow our own" management expertise from personal and production perspectives, the window of opportunity for this

Exhibit 5 Comparison of U.S. and Canadian Management Teams in Venture Capital Financed Early Stage KBCs



adjustment is narrow and does not afford this luxury. The short-term strategy, therefore, is to buy the expertise we need, to achieve critical mass.

SPARK Fiscal Committee has not included an analysis of B.C.'s educational system in our mandate. We are, therefore, not qualified to address possible issues in the way B.C. educates and trains our future scientists, technologists and business managers. The following recommendations are oriented towards building the right kinds of experience in management in the near term and are not viewed as activities to be substituted for well-designed curricula.

Program Recommendations 2, 3 and 4

THAT THE PROVINCE OF B.C. PARTICIPATE IN AN AGGRESSIVE INITIATIVE TO ATTRACT MORE SENIOR MANAGERS FROM OTHER JURISDICTIONS AND FROM OTHER MORE SECURE WORKING ENVIRONMENTS

— ***Recommendation 2***

That the Province provide a two year tax holiday for persons coming from outside B.C. to fill management vacancies in KBCs.

The SPARK Fiscal Committee recommends the introduction of a program providing a holiday from provincial income taxes for persons coming to a KBC from outside the province to fill positions which cannot be adequately filled from within. The program could resemble one now in effect in Quebec, or reflect similar provisions offered in B.C. pertaining to the International Financial and Shipping Centres. The tax holiday would be for a limited period, say two years. The immediate impact of the program would be to assist qualified B.C. businesses in the successful recruiting of needed management talent.

— ***Recommendation 3***

That the Province provide direct loan assistance to KBCs to spread the burden of relocation and recruiting costs over a management settling period.

According to senior executive recruiting professionals, recruiting costs represent real barriers to obtaining often critical key persons, especially those coming from the United States. The costs of recruiting, like many soft start-up costs, are not typically financeable.

By providing assistance to companies in the form of loans, this burden can be amortized over the manager's development and adjustment period, say two to three years. These loans will be repayable from royalties. The participation of eligible companies will also be restricted on a pro-rated (per 100 employees) basis. To ease administration, the SPARK Fiscal Committee recommends that

loans be automatic, and capped at the lesser of 50% of eligible expenses or $50,000. Eligible expenses would include search costs, moving expenses and real estate relocation differentials.

Provision of relief for the substantial early stage costs of recruiting would reduce much of the apparent resistance among early stage business managers to recruit to meet their growing management needs. Assuming a maximum cost of $50,000 per recruit, and the same rate of recruiting described below, just over $20 million could be loaned over the first five years of the program.

The SPARK Fiscal Committee estimates that at least 50 new managers could be recruited in the first years of programs 2 and 3. This number could increase by 25% per year thereafter. We anticipate that by year three in residence, an average of $125,000 in new sales and up to six additional hires could be attributed to each recruit. In addition, the SPARK Fiscal Committee believes that once here, even if a particular job does not work out or the original hiring company fails, a large percentage of the recruits will be tempted to stay in B.C. A base for a pool of managers with KBC start-up experience could be built in this manner. Assuming a program life of five years, forgone taxes could total $5.5 million, but the present value of the extra corporate and personal income taxes would reduce the total foregone tax estimate substantially.

— ***Recommendation 4***

That the Province urge the federal government to provide the $500,000 capital gains exemption only to employees who are investors in or owners of KBCs.

Certain changes in Canada's capital gains exemption were announced as part of the federal government's 1991 budget. Today, this major exemption from Federal income tax is available to all purchasers of shares in private Canadian controlled businesses. While this is a significant step forward, the regulation provides no special incentive for employee share ownership.

Current capital gains tax policy has a direct impact on the role of equity-based performance pay plans in KBCs. KBCs should be able to use equity instead of cash, if only to establish a relationship between risk/performance and reward. Salaries do not establish this relationship. An altered capital

gains tax exemption would result in increased provisions for and participation in equity-based compensation packages in B.C.-based KBCs.

While reducing operating risk, this change would bring B.C. businesses in line with the standard practice of successful North American KBCs. It should be noted that, if this is the only real holiday from capital gains tax, it should be a very good way to attract senior managers from the relative security of their jobs in established companies.

The SPARK Fiscal Committee recommends that the altered capital gains tax exemption be available *only* to genuine full-time employees who:

- buy shares of private KBCs;
- sell the shares only after having owned them for at least five years, three of which they are genuine full-time employees.

It is also recommended that, at any one time, an individual could own the shares of only one company which qualifies for the exemption.

This recommendation has three purposes:

- to help attract and keep experienced managers in KBCs;
- to replace for companies the high cash cost of competitive salaries with equity share offerings that are attractive; and,
- to encourage employees to invest in the companies for which they work.

The value of capital gains taxes foregone will depend on the equity offerings of individual companies as well as employee and corporate performance. The National Advisory Board on Science and Technology's Committee on the Financing of Industrial Innovation has recommended a much wider-ranging capital gains regulation. That Committee estimates that the tax revenues that could be foregone as a result of offering this exemption to all Canadian investors (not just employees) would be less than $500 million nationally, and would be deferred for at least three years. We believe that the result of the wider-ranging option would be to effectively water-down the incentive for key employees to leave other, more secure jobs and to invest in a

KBC. However, a corresponding payback in royalties, personal income and corporate income taxes paid should be anticipated. The SPARK Fiscal Committee has prepared a model that demonstrates the potential payback rates to B.C. illustrated below.

Potential Payback on Recommended Change in Capital Gains Tax Regulation

Company Value	*$ 10*	*$ 50*	*$200*
		(all $s million)	
Total Federal & Provincial Taxes Foregone, one time only	$ 1.2	$ 3.6	$ 8.4
Provincial Taxes Foregone, one time only	0.4	1.1	2.5
New B.C. Taxes Paid, per year			
- corporate	0.01	0.3	1.3
- personal	0.3	1.3	5.3
Payback period to B.C.	1.1 years	0.6 years	0.4 years

Key Assumptions:

1. *Employees do not get liquidity until K.C is 7 years old.*
2. *There is an "average" distribution of equity among founders, senior managers and employees.*
3. *The relationship between value of a company, revenues, profitability and number of employees is reflected in the following ratios:*

price/sales	*1.5:1*
price/earnings	*20:1*
sales/employee	*$100,000*
average employee salary	*40,000*
B.C. income tax as % of salary	*10%*
B.C. corporate tax as % of revenues	*1%*
B.C. proportion of cap.gains taxes levied	*30%*

Of course, any estimates of foregone tax revenue is based on the somewhat academic assumption that, in the absence of the proposed program, some or all of these taxes would be collected. The current rate of payment of capital gains tax in Canada would suggest that, in the absence of the program, a large proportion of the equity investment anticipated in the model will never happen, and very little in the way of capital gains tax will truly be foregone.

Program Recommendation 5

THAT THE PROVINCE OF B.C. ESTABLISH AN ACTIVE PROGRAM TO ENCOURAGE B.C.-TRAINED TECHNOLOGY AND VENTURE CAPITAL MANAGERS LIVING ELSEWHERE TO RETURN TO B.C.

Anecdotal evidence suggests that a significant number of Canadian-trained professionals are acting as senior managers in U.S. technology-based businesses and venture capital organizations. In addition to the programs recommended herein that should result in increased opportunities to apply their skills at home, the Province should provide incentives to encourage the returns of highly skilled ex-patriots.

The result of this program will be the quick development of a new stock of experienced venture capital managers and managers of other technical businesses. For the former, this is a first step in enhancing the quality of the venture management teams, and should lead to more private capital being invested in that sector. And for the KBCs with employees directly involved, the benefits would include improved professionalism in the management team.

PROGRAMS BUILDING A POOL OF KNOWLEDGEABLE EQUITY

The best types of funds for investing in small businesses are those which come with the "knowledge", care and attention which are applied when people who have been through it before and watch carefully over their own money. There are many advantages to having small companies directed by experienced persons with access to additional private funds, to market data, to additional sources of key personnel, to strategic relationships, and who have seen how to grow a company to the size where it can assume some permanence.

There are three sources of such funds:

- high net worth individuals who have a background in business;
- corporations which can lend help from within their own managerial ranks; and,
- venture capital pools managed by experienced personnel of the quality typified by Silicon Valley.

Canada has a relatively small number of each of these types of funding source, based on comparisons with our international competitors. B.C. companies by and large have no formal programs for financial or managerial involvement with KBCs. We have a particularly small collection of professional venture capital management teams. As mentioned earlier, Canadian-trained practitioners are leaving, not arriving.

Recent studies suggest that, throughout North America, private risk fund managers are shying away from early stage deals. The participation of wealthy individuals is stable, but not growing. However, the role of the public sector in the provision of risk capital for new businesses has exploded over the past three or four years.

This should be encouraging. However, it is clear that the manner in which governments are participating is *not* effectively attracting adequate levels of new

private equity to emerging and growth businesses. The result is a net reduction in the overall supply of risk capital as well as the productivity of the capital invested.

The SPARK Fiscal Committee recommends that the Province take an aggressive position in the development and maintenance of well-managed risk equity funds. These funds should have a mandate to participate in high potential return, early stage businesses engaged in the production and provision of productivity improving processes/technologies and high value-added products and services.

To this end, we recommend that the Province engage in two general activities:

- Help in establishing venture capital pools.
- Direct Provincial investment which complements and encourages private sector investors in KBCs.

Studies indicate that the creation of venture pools in an area, even if much of the money is invested outside B.C., foster development of new local industry. The national and international networking of professional pools of capital leads to cross investment.

The members of the SPARK Fiscal Committee also recommend that any resulting programs be based on two important principles:

- a partnership with private sector equity; and,
- the use of a system of provincial investments rather than the tax system.

There are three compelling reasons not to use the tax system for the purposes described above. Experience shows that tax incented investments often are not made on the merits of the investment but rather on the tax-savings. Second, a reduction of B.C. taxes can only help B.C. taxpayers, whereas we feel it is important to attract knowledgeable funds from outside B.C. and outside Canada. Furthermore, tax incentive schemes have a tendency to increase the "price" of equity, often beyond the value placed on the company by fund sources to whom the tax-savings are not relevant.

Program Recommendation 5

THAT THE PROVINCE OF BRITISH COLUMBIA, BY MATCHING PRIVATE SECTOR EQUITY, INVEST IN A SERIES OF NEW VENTURE CAPITAL FUNDS, WHICH IN TURN WILL INVEST IN KNOWLEDGE BASED COMPANIES

The steps being taken by the B.C. Privatization Benefits Fund to co-invest in suitable venture companies is a progressive and enlightening step. This recommendation, we hope, will provide further direction for current initiatives.

The Province should assist in the establishment of a series of privately managed funds in B.C. Managers would be selected from teams located in B.C., based on competence. The Province would invest in each fund, with a certain percentage of public funds dedicated to "B.C. only" investments. As Fund managers would be required to raise private sector capital, private sector profit performance would drive investing activity. The two critical factors in the proposal are:

- KBCs need knowledgeable interactive investors—not funds portioned out by a government supported agency where the principals do not have a personal financial commitment;

- Canadian venture capital corporations' difficulty raising significant pools of capital—due to uncertain returns—would be greatly reduced by having government support that did not fully participate in the profits.

The Province should receive a return on all funds invested, though at a rate that favours the private sector capital.

The Provincial investment should be in the range of $10 to $20 million per fund, sufficient to ensure that the fund can be self-supporting and attract good management. A good target over five years would be the creation of six to eight funds aggregating approximately $250 to $350 million. If these funds can be created, there should be productive synergistic and cooperative consequences.

This plan will require authority to make decisions based on the quality of management teams. To some extent, the teams will self-qualify, related to their ability to raise private sector funds, and to the plan they have for provincial participation. For example, some may raise money for "specific-purpose" funds (for example, a fund given over to companies whose products improve the productivity of our resource-based industries), some may target offshore investors, some may target Canadian institutions, and others may target the public. The Province should, however, set up guidelines to ensure that the management teams really are of a stature which qualifies them as being on a par with the good venture pool managers in competing jurisdictions. Otherwise, it will be difficult to syndicate B.C. investments into such funds.

Private funding sources will only invest if they are convinced of profit-making potential. Among other key elements, this almost certainly means that the investment objectives of the fund should include the ability to invest outside B.C.

Based on the assumptions outlined above and others detailed in **Appendix A**, direct financial returns to B.C. could be realized as early as year six of the program. Assuming a 15% average return over the investment period, but with a return skewed 60:40 in favour of the private sector, a positive cumulative net return could be achieved in year 13, and a direct doubling or better of the Provincial investment is entirely feasible.

Based on the creation of five to seven funds, a Provincial investment of up to $100 million, spread over about eight years, would be required.

The SPARK Fiscal Committee believes that Discovery Enterprises Inc. (or its management team) should be encouraged to seek private matching capital and qualify for the above program and that its mandate should be altered accordingly.

Co-investment in other areas with other venture capital pools provides for networking. The added depth of management in a co-investment situation should lead to better quality companies, and, ultimately, to direct investment by foreign venture capital pools in B.C. companies. Finally, by allowing geographic diversification, excellent venture capital managers should be attracted to B.C. and their experience of excellence will inevitably rub off on local industry.

Program Recommendation 7

THAT THE PROVINCE OF BRITISH COLUMBIA PROVIDE MATCHING INVESTMENTS FOR HIGH POTENTIAL/HIGH VALUE-ADDED COMPANIES WHICH RAISE SIGNIFICANT AMOUNTS OF PERMANENT EQUITY FROM THE PRIVATE SECTOR

This program is designed to change dramatically the manner in which the government would interact financially with promising KBCs. The purpose of the government investment is to mitigate the risks for the private sector without the subsidy being free. That is, there is a subsidy element to the plan, but the government should be able to achieve a return on its funds commensurate with the lower level of risk inherent in spreading risks over a wide range of opportunities.

These changes are radical, and are prompted in part by what we perceive to be deficiencies of the SBVCC program. However, it is not the intention to replace the SBVCC program, which in many ways has a mandate for providing capital to a wider cross-section of B.C. industry; but to supplement it for those KBCs which have promise to grow significantly. Among the issues are the following:

- The benefits of any program should go to the companies, not the investors. The prime motivation for investing should be the quality of the investment. Having said that, the net benefit in the program as proposed is actually better for investors on an after-tax basis than the SBVCC program.

- The discretion of the government in deciding which companies get the benefit should be minimized. It should be the private sector which, by investing prior to any government investment, votes with its dollars on the projects that are best to support. At the same time, there should be a structure by which the investee automatically is encouraged to live up to certain predetermined and universal objectives as to how it behaves. This implies it will be to the recipients' benefit to self-monitor—that is, provide the government with relevant operating statistics. The present SBVCC program does have a monitoring structure, but we understand that the government has a difficult

time collecting information, and an even tougher time applying sanctions for failure to live up to the requirements of the Act.

- Every effort should be made in structuring to encourage the private investors to pay attention to the company's affairs, and effort should be made to encourage those investors to be "knowledgeable" in the sense that that word is used throughout this report. This is designed to be more effective than is the case in the SBVCC program.

- The structure should encourage investors from outside B.C. to invest here. This is something the SBVCC program does not do.

- The government should get a direct return from the investees, though in a form which does not impact the capital structure of the investee. While it could be modified to do so, the SBVCC program has no built-in return for the government.

- The program must recognize that success for a KBC in today's economic climate means that upwards of $30 million may be required before the company is self-supporting. While this could also be modified, the SBVCC assumes that $5 million is sufficient.

The Matching Investment program is set up as a partnering between the private sector and government. The government would invest dollars only after the private sector has invested permanent equity. Provision would be made that the investees could not use any government funds to repay investors.

The program would work as follows:

1. A KBC (defined carefully for legal reasons) which raises at least $500,000 in permanent equity from the private sector could apply for a matching investment of up to 60% of those funds, with an upper limit of $12 million from the Province.

   This program compares favourably to the SBVCC, from the investor's perspective. The comparison is illustrated below.

	SBVCC	***Matching Investment***
Investor's funds	$1,600,000	$1,000,000
Repayment by Province (30%)	(480,000)	
Net cost to Investor	$1,120,000	$1,000,000
Provincial Matching Investment		600,000
Net received by Investee	$1,600,000	$1,600,000
Reduced net after-tax cost to the Investor		120,000

Basing the matching investment on the private sector input would clearly encourage investors from outside the Province to participate, whereas this occurs in the limited cases of some pension funds in the SBVCC program.

2. The KBC itself or its owners must provide a bond in the form of cash or the equivalent (say, Treasury Bills) or a non-retractable letter of credit from a Canadian bank for the full amount of the government investment. This bond could be called upon by the Province as repayment of the investment if the company failed to meet certain guidelines. The bond would be retained by the Province.

   These guidelines, which would be universal for all investees, would include the following points.

   - The company must spend an amount equal to the provincial investment on product research, product development, product marketing and product selling activities;

   - The company could not spend any funds on certain activities, such as purchase of real estate, stock market promotional activity (non-product marketing), purchase of other companies, purchases of any assets from any manager or investor, etc. This feature is designed for two main purposes: to prevent abuse, and to encourage the investors to spend time

with the company ensuring that the bond is removed. Compliance would require that the firm was audited.

- The company would have to remain a "B.C. company" in some defined sense—i.e., it could not move the bulk of its activities outside the Province.

- It would be up to the company to prove that it had met the guidelines. A failure to do so within a given time frame would result in the seizure of the bond.

We expect that investors would charge the investee for putting up the bond. This amounts to the market really being the determinant of which projects should be financed. Incidentally, there is no reason why this should prevent public companies from participating, though we assume that it will be one or two major shareholders who would provide the bond. They would thereby fulfil a role sometimes missing from public financings of early stage companies—that of investors who pay serious attention to investee affairs.

In the early stages, therefore, the only activities of the Province would be to pass on the merits of the bond to ensure that the company meets the definition of a KBC. Later, it would receive audited statements from companies as they attempt to have their bond removed.

3. The Province would receive a royalty on the sales of the investee as a way of getting its investment back, plus a return. This could be capped at, say, twice the size of the Matching Investment, or could have a rate of return associated with it.

One feature commented on since the draft report has been the $500,000 "hurdle". The SPARK Fiscal Committee believes that there must be significant evidence that the private sector believes in the project, and that it is very unlikely that any company can succeed to the extent that it becomes a significant concern unless it has the backing of at least $500,000 in private funds. The Committee does, however, agree that "sweat equity" should count in achieving that hurdle.

The Committee also agrees that there are two real obstacles to overcome for this plan to work.

First, the funds would actually be paid out. This compares to the results of the SBVCC program, where the government subsidy is a foregone revenue. In the former case, a Ministry will have to take responsibility for an investment. Today, in comparison, Ministries do not take such responsibility, so failure is not attributed directly to program administrators.

Second, the plan will only apply to KBCs, so the definition of a KBC will have to be clear, avoiding interpretation and possible legal action. This might be easier said than done. The definitions of what is acceptable spending by the companies as they attempt to redeem their bonds must also be clear.

SPARK Fiscal Committee
Final Report

January, 1992

The members of the Fiscal Committee wish to thank SPARK for bringing us together. We also appreciate the considered comments and submissions that were received from many representatives of B.C.'s business, government and academic communities. We believe that the recommendations in this report reflect the practical experience of the Committee members and take into consideration all of the feedback that was received over a year of discussion with various publics.